

#### REMARKS

On December 20, 1991 a Notice of Allowability was issued for claims 18-33. On April 20, 1992, before a patent issued, this application was withdrawn from issue. On April 27, 1992, an Examiner's Action was mailed, wherein the Examiner rejected claims 18-33 under the judicially created doctrine of obviousness-type double patenting based on the Examiner's contention that claims 18-33 were not "patentably distinct" from the claims of U.S. Patent No. 5,026,798. On July 24, 1992, applicant submitted a Response To Examiner's Action that traversed the Examiner's rejection. Applicant also submitted a Terminal Disclaimer to expedite prosecution. On August 24, 1992, a second Notice of Allowability was issued. The issue fee has not been paid. Note that an interference (Interference No. 102,954) has been declared involving U.S. Patent No. 5,026,798 ("the '798 patent").

The undersigned appreciates the September 11, 1992 personal interview with Supervisor Schofer and Examiner Wu. During that interview it was requested that M.P.E.P. § 714.16 be discussed in this paper. The specific sentence discussed during the interview says:

"As to amendments affecting the disclosure, the scope of any claim, or that add a claim, the remarks accompanying the amendment must fully and clearly state the reasons on which reliance is placed to show: (1) why the amendment is needed; (2) why the proposed amended or new claims require no additional search or examination; (3) why the claims are patentable and, (4) why they were not earlier presented."

Applicant respectfully requests entry of the above amendments. The amendments to the specification change the letter B to the letter T to correct a clerical error. This correction is also made in claim 18. The amendments are needed to ensure proper reading of the claims. No substantive change is intended by this amendment, and thus there is no need for an

additional search or for additional examination. The claims remain patentable, as they were when allowed by the Examiner. The amendment was not presented earlier because the error was not noticed until after scrutiny of the claims during work on the interference (Interference No. 102,954) that was recently declared involving the related '798 patent. For these reasons, applicant respectfully requests entry of the amendment changing the letter B to the letter T.

The other amendments (to claims 18 and 24) correct the definition of the ligand "Q" by moving a phrase from dependent claim 24 to independent claim 18. The phrase that appears in claim 24 states "provided that where any Q is a hydrocarbonyl such Q is different from  $(C_5H_{4-x}R_x)$ ." First, this phrase has a typographical error because the cyclopentadienyl ligand should be represented by the formula  $(C_5H_{5-y-x}R_x)$ . Second, moving the phrase to claim 18 will narrow the scope of claim 18 by eliminating cyclopentadienyl rings as ligands that can be Q. Applicant's research in this area has focused on compounds, catalyst systems and processes of polymerizing with a catalyst using a compound that has only one cyclopentadienyl ring. As such the definition of Q is too broad because the phrase "univalent anionic ligand" includes cyclopentadienyl ligands -- allowing the claims to literally cover processes that use bis-cyclopentadienyl and tris-cyclopentadienyl compounds as catalyst precursors. Since, this amendment narrows the allowed claims, there should be no new search required, no new issues presented and no additional examination needed. Also, the claims should remain patentable, as before the amendment. Finally, as before, the amendment was not presented earlier because the error in the scope of the definition of Q was not noticed until after scrutiny of the claims during work on the interference

(Interference No. 102,954) that was recently declared involving the related '798 patent.

Applicant also respectfully requests addition of claims 34-36. Independent claims 34 and 35 are each directed toward a different species of the allowed genus. Multiple dependent claim 36 is directed toward a specific process phase, and is dependent on each of claims 34 and 35.

Claim 34 is directed to a process of polymerizing using a catalyst system comprising the reaction product of an "unbridged" group 4 transition metal component and an alumoxane. Similarly, claim 35 is directed to a process of polymerizing using a catalyst system comprising the reaction product of a "bridged" group 4 transition metal component and an alumoxane. Each of these claims is directed to a patentably distinct species of the genus and would allow applicant to more fully claim her invention. Thus, the amendment is needed.

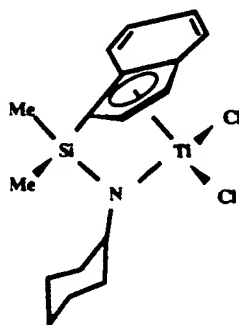
Moreover, because the genus claim (claim 18) has already been found patentable, the species claims to the unbridged and bridged species should also be patentable. No new search should be necessary nor are new issues presented. Also, no new matter has been added, and the claims are fully supported by the specification. The bridged species is disclosed, for example, at page 10, lines 3-18; page 12, line 28 to page 13, line 3 and pages 18-26. The unbridged species is disclosed, for example, at page 13, lines 4-9 and 13-15.

Again, the additional claims presented in this amendment were not presented earlier because the claims pending in this application were carefully scrutinized during work on the interference (Interference No. 102,954) that was recently declared involving the '798 patent. Applicant has carefully examined the claims in this application and the claims in the

'798 patent involved in the interference, and believes that the claims are patentably distinct, as was argued in the July 24, 1992 Response To Examiner's Action.

The process of polymerizing  $\alpha$ -olefins (i.e., olefins having 3 to 20 carbon atoms, which excludes ethylene) into stereoregular poly- $\alpha$ -olefins is a separate patentable invention from the general process of polymerizing. Stereoregular (i.e., crystalline) poly- $\alpha$ -olefins have a specific set of properties relative to polyolefins in general, e.g., higher glass transition temperatures, higher melting points, and thus, different utilities.

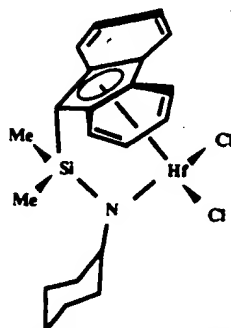
There is a unique set of problems presented in polymerizing a polymer that has a stereoregular structure. The catalyst system must be designed with an active metal site surrounded by ligands that influence the orientation of the  $\alpha$ -olefin as it approaches the polymerization site. For example, Example 7 in the '798 patent show a polymerization that results in a highly crystalline isotactic polypropylene using a catalyst comprised of the precursors (1) methyl alumoxane and (2) a monocyclopentadienyl transition metal compound having the structure:



This transition metal compound has an environment about the titanium metal atom to produce stereoregular poly- $\alpha$ -olefins.

Also, Example 5 in the '798 patent show a polymerization that results in a highly crystalline isotactic polypropylene using a catalyst comprised of the precursors

(1) methyl alumoxane and (2) a mono-cyclopentadienyl transition metal compound having the structure:



There is no teaching or suggestion in the '690 application that these compounds would make catalysts that polymerize  $\alpha$ -olefins into such highly crystalline polymers. Thus, the catalyst function in making crystalline poly- $\alpha$ -olefins is different from polymerizing ethylene, where the approach of the monomer to the active metal polymerization site is not a concern. Also, if the catalyst does not control orientation of the monomer (for monomers having 3 to 20 carbon atoms), then the polymer produced is typically amorphous.

The control of the  $\alpha$ -olefin orientation requires a specific mono-cyclopentadienyl catalyst structure that is a patentably distinct species from the general mono-cyclopentadienyl catalyst -- making the polymerization of an  $\alpha$ -olefin into a crystalline poly- $\alpha$ -olefin a patentably distinct species of the general process of polymerizing. This particular structure requires a bridging group between the cyclopentadienyl ring and the anionic heteroatom ligand. Moreover, the compound must be either chiral about the metal atom, or have a specific cyclopentadienyl structure -- namely a fluorenyl-type ligand. This distinguishes the compounds, the catalyst and the process of polymerizing.

Thus, while the '798 patent discloses a polymerization process for making crystalline poly- $\alpha$ -olefins, this specifically

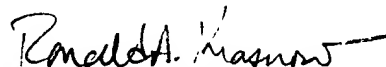
designed process and catalyst is patentably distinct from the genus being claimed in the '690 application. Therefore, applicant respectfully submits that claims 18-33 and 34-36 are patentably distinct from claims 1-13 of the '798 patent.

Also, based on this distinction, and the reasons discussed above, applicant respectfully requests that claims 34-36 be added to this application, and allowed.

CONCLUSION

Applicant respectfully requests that the Examiner reconsider this application, enter the amendments and added claims, and issue a new notice of allowance.

Respectfully submitted,



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